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CENTRAL INTELLIGENCE AGENCY

OFFICE OF NATIONAL ESTIMATES

17 September 1965

MEMORANDUM FOR THE DIRECTOR

SUBJECT: Review of Estimate on Soviet Manned Lunar Landing

REFERENCE: NIE 11-1-65: "The Soviet Space Program" (SECRET, 27 January 1965)

1. In our most recent estimate on the Soviet space program, referenced above, we specifically considered the possibility that the USSR had underway a manned lunar landing program in competition with Project Apollo. The paragraphs from the estimate in which we dealt with this possibility appear below.

> 59. Manned Lunar Landing. It seems certain that the Soviets intend to land a man on the moon sometime in the future, but there are at present no specific indications of any such project aimed at 1968-1969, i.e., intended to be competitive with the US Apollo project. Some R&D effort toward a manned lunar landing is almost certainly in progress and we note that considerable preparatory work could have been going on without as yet providing firm indications of its nature. Although many of the critical prerequisites for a manned lunar landing have not been observed in Soviet space operations, we would not necessarily see them this early.

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60. We have estimated that a very large booster (about five million pounds thrust) could become available for manned space flight in 1968. We doubt that the thrust of this booster would be sufficient for a manned lunar landing mission without earth-orbit rendezvous or the US technique of lunar-orbit rendezvous. If the earth-orbit rendezvous technique were used, some one to three rendezvous probably would be required, depending on the actual thrust of the booster and Soviet success in reducing the weights of structures and components below present levels. Thus a Soviet attempt at a manned lunar landing in a period competitive with the present US Apollo schedule cannot be ruled out.

61. To compete in this fashion, however, the Soviets would have had to make an initial decision to this effect several years ago and to have sustained a high priority for the project in the ensuing period. This would have required them to undertake a burdensome and rapid extension of their space technology and to reconcile the heavy demands of this project with those of other important space ventures and military programs, all with no clear assurance that they would triumph. The appearance and non-appearance of various technical developments, economic considerations, leadership statements, and continued commitments to other major space missions all lead us to the conclusion that a manned lunar landing ahead of the present Apollo schedule probably is not a Soviet objective.

62. With a very high degree of success in all phases of the project, the first Soviet attempt at a manned lunar landing might occur as early as 1969. In view of the magnitude of the technological problem and the level of resources which the Soviets are likely to commit to this project, we believe a more probable date for such an attempt to be a few years later.

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Technical Factors

2. The evidence acquired since publication of the estimate is consistent with these judgments. They were based primarily upon the technical evidence concerning Soviet capabilities to accomplish all the steps necessary to undertake a manned lunar landing. A crucial element was the probable timing of a Soviet program to develop a suitably large booster (i.e., with a thrust of about five million pounds).

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flight test of a vehicle could occur in late 1966 or early 1967 if it had been built and static tested elsewhere. On the other hand if the first flight vehicle is to be first assembled and static tested at Complex J, the first flight test would probably occur sometime in 1968.

4. The evident Soviet interest in lunar exploration was a factor in our judgment that the Soviets intend to undertake a manned lunar landing sometime in the future. The pace of this Soviet program, however, has been uneven, and it has been generally unsuccessful. From late 1958 to early 1960, the Soviet space program concentrated heavily on the moon with an estimated nine firings, only three of which were successful. No more lunar attempts were made until 1963, although ten probes were launched toward Mars and Venus. Three lunar probes were launched in 1963, and two in 1964; all of these were unsuccessful. Since publication of NIE 11-1-65, four more lunar probes have been launched, which were also unsuccessful, and a fifth was cancelled in September. These more recent shots appear to be attempts to soft land scientific payloads on the moon. The two launched in May and June demonstrated a Soviet willingness to accept less favorable launch conditions, and suggested an increased urgency in the program. This could relate to the manned lunar landing program, but it may represent an attempt to counter the successes of the US Ranger program.

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Political and Economic Factors

5. Since the first of the year we have acquired no evidence that the new leadership in the USSR has taken any decisions to change the course or the scope of the Soviet space program. Statements made by Soviet authorities since January continue to affirm the existence of a manned lunar landing program, but fail to specify a target date for the accomplishment of this mission. The most recent remarks in this vein were made by cosmonaut A. Leonov in Athens. Speaking before the 16th International Astronautical Congress this month he stated:

> "It seems to me that not distant is the time when there will appear orbital multimanned research laboratories whose crews will be relieved at regular intervals. They will be followed by cosmic luniks, and man's landing on the moon and other planets of the solar system." (Tass International Service in English)

On the surface, this statement appears to be consistent with our other evidence and with the conservative judgments made in the estimate.

6. There has been no substantial change in the economic situation likely to affect the space program. In NIE 11-1-65 we called attention to the high cost of a manned lunar landing program and to the competition between civilian and military claimants for scarce high-quality resources in the Soviet economy. This competition has not lessened and may have intensified. The new leaders are pushing ahead with the modernization of industry, and Brezhnev's agricultural proposals appear even more ambitious than those of Khrushchev. There are

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also indications that military expenditures, which had substantially leveled off in the past two years will begin to rise again. Public statements by the new leaders in the first few months after Khrushchev's overthrow gave no indication that issues of military policy were under active debate. Military policy has now come back to the forefront of public commentary, and present indications are that the claims of defense are being given a sympathetic hearing in the policy councils of the regime. A number of the top Soviet leaders have publicly declared their commitment to strengthening the defenses of the country, and particular emphasis has been given to military research and development, which is directly competitive with the space program.

7. We do not believe, of course, that economic considerations are an overriding factor in Soviet thinking. The resources which the Soviet leaders have already committed to the space effort are indicative of the political importance which they attach to it. We consider still valid the judgments of NIE 11-1-65 as to the impact of political considerations on future Soviet efforts:

> 35. For political reasons, however, the Soviets could ill afford to slacken in the space race and from all indications they have no intention of doing so.

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The USSR's space program has become a key element in Soviet world prestige. Space remains the major area in which the Soviets can still propound a credible claim to world primacy. We expect that the Soviet space program will involve a range of undertakings which in their overall impact will be strongly competitive with the US program during the next five to ten years.

Future Prospects

8. If the Soviets have not chosen to race to the moon, we expect that they will endeavor to soften the impact of a successful Apollo mission by the achievement of other goals of their own choosing. They have openly questioned the scientific significance and necessity of a manned lunar landing, and will probably substitute goals to which they can attribute greater meaning. Extensive earth orbital operations and the establishment of a system of major space stations in a period when the US has no comparable program would enable the Soviets to dull the effects of a successful US landing on the moon. A vigorous Soviet program of instrumented lunar exploration is also indicated by Soviet statements which emphasize the necessity for extensive activity of this type prior to any attempts at a manned landing. An early Soviet manned circumlunar flight is considered in the

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estimate as an additional mission aimed at offsetting the effects of a successful Apollo mission and reinforcing the association of the Soviet Union with the early exploration of the moon.

9. Our estimate of Soviet capabilities to establish a large space station and to essay a manned circumlunar flight was based on development of a new large booster of at least two million pounds thrust. We estimate that the booster used in the launching of Proton I had a thrust on the order of two and a half million pounds. We had estimated that the first flight of this new vehicle would occur sometime in the first half of 1965; the Proton I launching took place on 16 July. We believe, therefore, that the estimate of likely dates for orbitin a large space station and for manned circumlunar flight using this new booster -- i.e., in the 1968-1969 period -- remains generally valid. "Professor Oleg Gazenko, deputy chief of the Soviet delegation in Athens, alluded in conversation to Soviet plans for a 15-day manned orbital flight; this appears consistent with Leonov's statement on the future establishment of a large space station."

10. The Soviets could place in orbit even larger space stations using the very large vehicle (i.e., of about five million pounds) which we believe to be under development. The Soviets might plan to use such stations in their manned lunar landing program. In NIE 11-1-65, we discussed this possibility as follows:

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63. If the Soviets choose to direct their space station efforts toward even more extensive manned exploration of space, they may develop very large quasi-permanent stations for the assembly and launching of spacecraft from near-earth orbit. Indeed, a number of Soviet statements suggest that they view this as an attractive approach to subsequent manned flight into deep space. A suitably large space station probably could be created in the early 1970's by making use of the same very large booster we have discussed above. If so, a manned lunar landing mission launched from a space station could occur in the middle 1970's.

11. The Soviets have additionally stated their intention to establish a lunar base subsequent to manned lunar landing but no significant details or meaningful timetables have been revealed. If Soviet manned lunar landing is undertaken as a follow-on to extensive earth orbital operations and instrumented exploration of the moon, it is likely that they will enjoy some advantages in the establishment of a lunar base. Such an approach would allow for the concurrent development of the technology of lunar transporation and that of maintaining man in space for extended periods. It is possible that a late lunar landing may be followed fairly rapidly by the establishment of a Soviet base on the moon.

12. In sum, we expect the Soviets to pursue a vigorous and expanding space program generally competitive with that of the US. We do not believe that they are engaged in a manned lunar landing

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program competitive with Project Apollo, but we cannot rule this possibility out. We continue to estimate that they could achieve a manned lunar landing about mid-1969 at the earliest. If they detect slippage or stretchout in the US program, they might be moved to accelerate their own.

FOR THE BOARD OF NATIONAL ESTIMATES:

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SHERMAN KENT
Chairman

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-18 Mos. behind U.S. & their objective is a manned lunar landing
- Might not be that far behind us if they're planning a different approach

1470 Nature of the competition changes the scene of applications - not of first

Program competitive - broad - not confined
- one clear objective - considerable uncertainties - they may be up
- if they have closer manned lunar landing they may be up
have picked booster which fine or great
operability.

Next gear will be very important.

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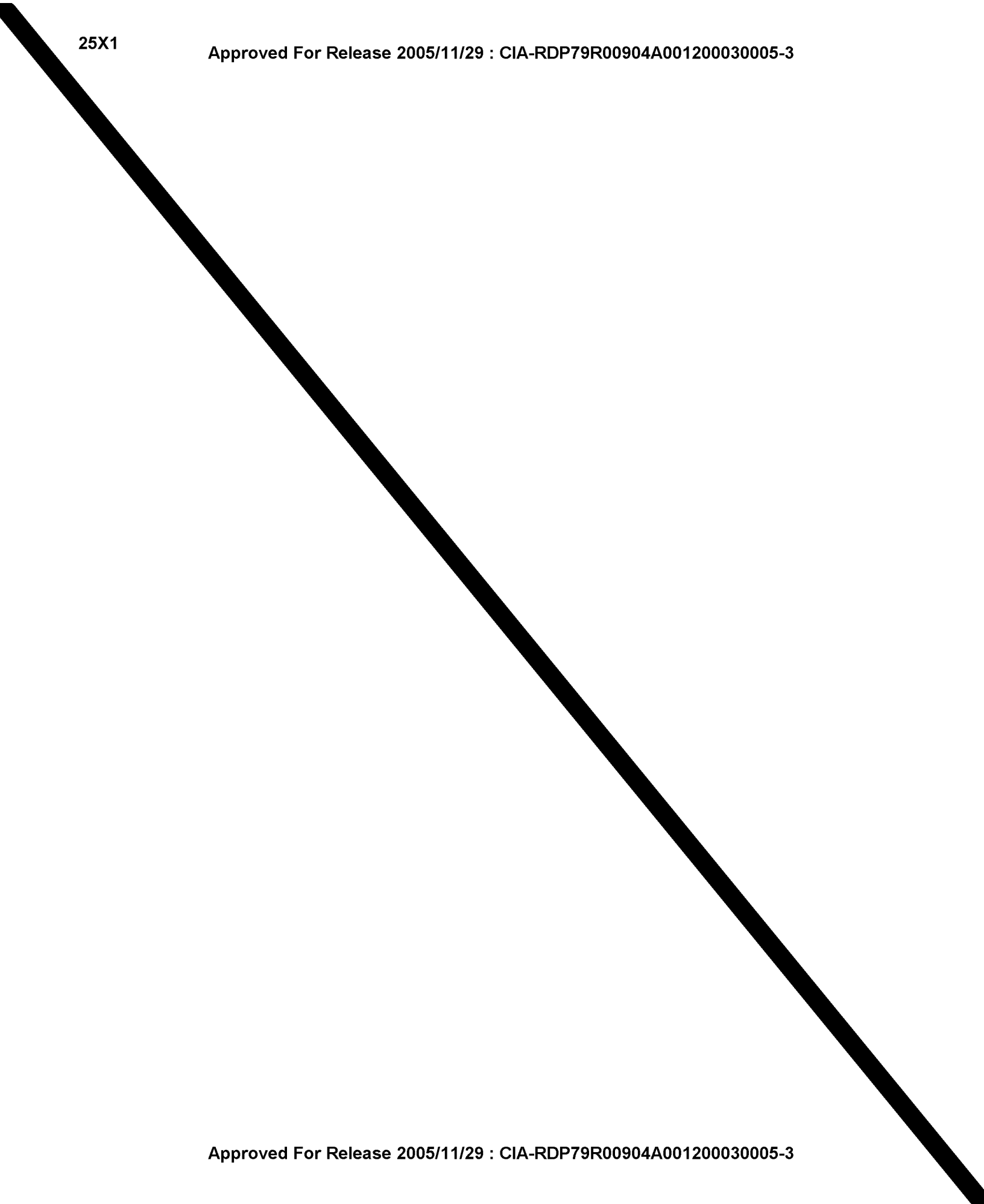

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